

16  
Dmv

216-01

SEQUENCE LISTING

<110> King, Kendall W  
Madura, Rebecca A  
Rosey, Everett L

<120> NUCLEIC ACIDS AND PROTEINS OF THE MYCOPLASMA PNEUMONIAE  
mhp3 GENE AND USES THEREOF

<130> PC10555

<140>

<141>

<150> US 60/156,602

<151> 1999-09-29

<160> 41

<170> PatentIn Ver. 2.1

<210> 1

<211> 1692

<212> DNA

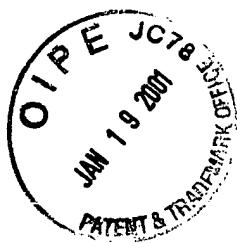
<213> Mycoplasma hyopneumoniae

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tcaacactat tagtgcgc tggaccact actgaaattt tctcgatatt aatcgcaaac 1020  
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gaagaaaaaa ctaagacaat tcctgcccga gaagttcgta aaactttaga aattccggaa 1380  
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aataaaaaatt aagtaagaaa aaataacaat ttttaacat tataatcttt ttttagagatt 1500  
aatttcttc taatttagtt taatttaata taaaattata taaaattaaa aaaataaaaa 1560  
atccggacta ttttggttcc ggattttta ttttggttt actatttaat ataatgataa 1620  
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<210> 2

<211> 451



<212> PRT

<213> Mycoplasma hyopneumoniae

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Met Lys Lys Lys Ile Lys Trp Asn Lys Phe Leu Gly Leu Gly Leu Val  
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Phe Pro Leu Ser Ala Ile Ala Thr Ile Ser Ala Gly Cys Trp Asp Lys  
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Glu Thr Thr Lys Glu Glu Lys Ser Ala Asp Asn Gln Asn Lys Gln Ile  
35 40 45

Thr Asp Val Ser Lys Ile Ser Gly Leu Val Asn Glu Arg Lys Ser Glu  
50 55 60

Ile Met Ala Ala Lys Ala Asp Ala Asn Lys His Phe Gly Leu Asn Met  
65 70 75 80

Ala Ile Val Thr Ala Gly Gly Thr Val Asn Asp Asn Ser Phe Asn Gln  
85 90 95

Ser Ser Trp Glu Ala Ile Gln Gln Leu Gly Ala Leu Thr Gly Gly Glu  
100 105 110

Ile Thr Ser Val Asp Ser Ser Thr Ala Glu Leu Glu Gly Lys Tyr Ser  
115 120 125

Ser Leu Ala Asn Thr Asn Lys Asn Val Trp Val Leu Ser Gly Phe Gln  
130 135 140

His Gly Asp Ala Phe Thr Arg Trp Leu Lys Ile Pro Glu Asn Lys Gln  
145 150 155 160

Leu Phe Thr Glu Lys Asn Ile Ile Leu Gly Ile Asp Trp Thr Asp  
165 170 175

Thr Glu Asn Val Ile Pro Thr Gly Arg Tyr Ile Asn Leu Thr Tyr Lys  
180 185 190

Thr Glu Glu Ala Gly Trp Leu Ala Gly Tyr Ala Asn Ala Ser Phe Leu  
195 200 205

Ala Lys Lys Phe Pro Ser Asp Pro Thr Lys Arg Ser Ala Ile Val Ile  
210 215 220

Gly Gly Gly Ile Ser Pro Ala Val Thr Asp Phe Ile Ala Gly Tyr Leu  
225 230 235 240

Ala Gly Ile Lys Ala Trp Asn Leu Lys Asn Ser Asp Lys Lys Thr Lys  
245 250 255

Ile Thr Thr Asp Lys Ile Glu Ile Asn Leu Gly Phe Asp Val Gln Asp  
260 265 270

Thr Ser Thr Lys Glu Arg Leu Glu Gln Ile Ala Ser Lys Asp Lys Pro  
275 280 285

Ser Thr Leu Leu Ala Val Ala Gly Pro Leu Thr Glu Ile Phe Ser Asp  
290 295 300

Ile Ile Ala Asn Gln Asn Asp Arg Tyr Leu Ile Gly Val Asp Thr Asp  
305 310 315 320

Gln Ser Leu Val Tyr Thr Lys Thr Lys Asn Lys Phe Phe Thr Ser Ile  
325 330 335

Leu Lys Asn Leu Gly Tyr Ser Val Phe Ser Val Leu Ser Asp Leu Tyr  
340 345 350

Thr Lys Lys Ser Asn Ser Arg Asn Leu Ala Gly Phe Glu Phe Gly Lys  
355 360 365

Lys Ser Ala Thr Val Tyr Leu Gly Ile Lys Asp Arg Phe Val Asp Ile  
370 375 380

Ala Asp Thr Ser Leu Glu Gly Asn Asp Lys Lys Leu Ala Thr Glu Ala  
385 390 395 400

Ile Ser Glu Ala Lys Lys Glu Phe Glu Glu Lys Thr Lys Thr Ile Pro  
405 410 415

Ala Glu Glu Val Arg Lys Thr Leu Glu Ile Pro Glu Met Pro Asp Lys  
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Gln Pro Asp Lys Gln Gln Glu Ser Leu Asp Lys Leu Ile Thr Asp Ile  
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Asn Lys Asn  
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<210> 3

<211> 1269

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: mhp3  
manipulated for in vitro expression

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aaagctgatg caaacaaca ttttggcta aatatggcaa ttgttaaccgc tggtgaaacg 180  
gtaaatgata attcatttaa ccaatcargt tgggaggcgttcaacaact tggcgctctt 240  
actggagggtg agattacttc agtagatagt tcaactgctg aacttgaagg aaaatatacg 300  
tcacttgcta ataccaacaa aaatgtttgg gtactttctg gtttcaaca cggtgatgct 360  
ttcacaaagat ggttaaaaat ccctgaaaaat aagcaattat ttactgaaaa aaatattatac 420  
atactcgaa ttgactggac tgatactgaa aatgttaattt caacagggtcg atatattaaat 480  
ttaacctata aaactgaaga agccggatgg cttgcaggat atgcaatgcttcccttttg 540  
gcaaaaaaat tcccaagtgta tccaactaaa agatcagcaa ttgttatcgg tggggatt 600  
tcgcctgtaactgattt tattcgctggt tatctgatccg gaattaaagc ttggaaatcta 660  
aaaaattctg ataaaaaaac aaagataaca actgataaaa tcgagataaa tcttgggttt 720  
gatgttcaag atacttcaac aaaagaaaga cttgaacaaa ttgttcaaa agataaacct 780  
tcaacactat tagctgtcgc tggaccactt actgaaattt tctcgatataatcgcaaac 840  
caaaatgatc gttatctcat tgggtttgac accgaccaat cacttgttta tacaaaaact 900  
aaaaataaaat ttttcacctc aatttgaaa aatttagttt actccgtttt cagcgttctt 960  
agtgatttat ataccaaaaa atcaaattca agaaatttag ccggtttga atttggtaaa 1020  
aaaagtgcaa ccgttatct tggattaaa gacaggttg tcgatattgc tgataacttct 1080

ttagaaggca atgataaaaa actcgcaact gaagccattt ctgaagctaa aaaagaattt 1140  
gaagaaaaaa ctaagacaat tcctgccgaa gaagttcgta aaactttaga aattccggaa 1200  
atgcctgata aacaacctga taagcaacag gaaagcttag acaaactaat taccgatatt 1260  
aataatcta 1269

<210> 4  
<211> 423  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: mhp3  
manipulated for in vitro expression

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1 5 10 15  
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Arg Lys Ser Glu Ile Met Ala Ala Lys Ala Asp Ala Asn Lys His Phe  
35 40 45  
Gly Leu Asn Met Ala Ile Val Thr Ala Gly Gly Thr Val Asn Asp Asn  
50 55 60  
Ser Phe Asn Gln Ser Gly Trp Glu Ala Ile Gln Gln Leu Gly Ala Leu  
65 70 75 80  
Thr Gly Gly Glu Ile Thr Ser Val Asp Ser Ser Thr Ala Glu Leu Glu  
85 90 95  
Gly Lys Tyr Ser Ser Leu Ala Asn Thr Asn Lys Asn Val Trp Val Leu  
100 105 110  
Ser Gly Phe Gln His Gly Asp Ala Phe Thr Arg Trp Leu Lys Ile Pro  
115 120 125  
Glu Asn Lys Gln Leu Phe Thr Glu Lys Asn Ile Ile Ile Leu Gly Ile  
130 135 140  
Asp Trp Thr Asp Thr Glu Asn Val Ile Pro Thr Gly Arg Tyr Ile Asn  
145 150 155 160  
Leu Thr Tyr Lys Thr Glu Glu Ala Gly Trp Leu Ala Gly Tyr Ala Asn  
165 170 175  
Ala Ser Phe Leu Ala Lys Lys Phe Pro Ser Asp Pro Thr Lys Arg Ser  
180 185 190  
Ala Ile Val Ile Gly Gly Ile Ser Pro Ala Val Thr Asp Phe Ile  
195 200 205  
Ala Gly Tyr Leu Ala Gly Ile Lys Ala Trp Asn Leu Lys Asn Ser Asp  
210 215 220  
Lys Lys Thr Lys Ile Thr Thr Asp Lys Ile Glu Ile Asn Leu Gly Phe  
225 230 235 240

Asp Val Gln Asp Thr Ser Thr Lys Glu Arg Leu Glu Gln Ile Ala Ser  
245 250 255

Lys Asp Lys Pro Ser Thr Leu Leu Ala Val Ala Gly Pro Leu Thr Glu  
260 265 270

Ile Phe Ser Asp Ile Ile Ala Asn Gln Asn Asp Arg Tyr Leu Ile Gly  
275 280 285

Val Asp Thr Asp Gln Ser Leu Val Tyr Thr Lys Thr Lys Asn Lys Phe  
290 295 300

Phe Thr Ser Ile Leu Lys Asn Leu Gly Tyr Ser Val Phe Ser Val Leu  
305 310 315 320

Ser Asp Leu Tyr Thr Lys Lys Ser Asn Ser Arg Asn Leu Ala Gly Phe  
325 330 335

Glu Phe Gly Lys Lys Ser Ala Thr Val Tyr Leu Gly Ile Lys Asp Arg  
340 345 350

Phe Val Asp Ile Ala Asp Thr Ser Leu Glu Gly Asn Asp Lys Lys Leu  
355 360 365

Ala Thr Glu Ala Ile Ser Glu Ala Lys Lys Glu Phe Glu Glu Lys Thr  
370 375 380

Lys Thr Ile Pro Ala Glu Glu Val Arg Lys Thr Leu Glu Ile Pro Glu  
385 390 395 400

Met Pro Asp Lys Gln Pro Asp Lys Gln Gln Glu Ser Leu Asp Lys Leu  
405 410 415

Ile Thr Asp Ile Asn Asn Leu  
420

<210> 5  
<211> 602  
<212> DNA  
<213> Mycoplasma hyopneumoniae

<400> 5  
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gagctatatt ttccttcaag ttcaagcagtt gaactatcta ctgaagtaat ctcacccca 180  
gtaagagcgc caagttgtt aattgcctct caacttgatt ggttaatgta attatcattt 240  
accgttccac cagcggttac aattgccata tttagccaa aatgtttgtt tgcatcagct 300  
tttgcggcca taatttcgga tttcgttca ttaactagtc ctgaaattt tgagacatca 360  
gtgatttgct tattttgatt atcggtcgat ttttcttctt tagttgttcc tttatccaa 420  
catccggcag agattgtcgc gattgtcga agcggaaaaa ctaaggctaa gccaaagaat 480  
ttatttcatt ttatctttt tttcatagtt gttctccaa ttaattgttt taattacgat 540  
gactttcaat tatttttaa taaattaatt tttatttac attttctatt atattcaaaa 600  
ac 602

<210> 6  
<211> 200  
<212> PRT

<213> Mycoplasma hyopneumoniae

<400> 6

Met Ile Ile Phe Phe Ser Val Asn Asn Cys Leu Phe Ser Gly Ile Phe  
1 5 10 15

Asn His Leu Val Asn Ala Ser Pro Cys Trp Lys Pro Glu Ser Thr Gln  
20 25 30

Thr Phe Leu Leu Val Leu Ala Ser Glu Leu Tyr Phe Pro Ser Ser Ser  
35 40 45

Ala Val Glu Leu Ser Thr Glu Val Ile Ser Pro Pro Val Arg Ala Pro  
50 55 60

Ser Cys Trp Ile Ala Ser Gln Leu Asp Trp Leu Asn Glu Leu Ser Phe  
65 70 75 80

Thr Val Pro Pro Ala Val Thr Ile Ala Ile Phe Ser Pro Lys Cys Leu  
85 90 95

Phe Ala Ser Ala Phe Ala Ala Ile Ile Ser Asp Phe Arg Ser Leu Thr  
100 105 110

Ser Pro Glu Ile Phe Glu Thr Ser Val Ile Cys Leu Phe Trp Leu Ser  
115 120 125

Ala Asp Phe Ser Ser Leu Val Val Ser Leu Ser Gln His Pro Ala Glu  
130 135 140

Ile Val Ala Ile Ala Glu Ser Gly Lys Thr Lys Pro Lys Pro Arg Asn  
145 150 155 160

Leu Phe His Phe Ile Phe Phe Ile Val Val Leu Leu Ile Asn Cys  
165 170 175

Phe Asn Tyr Asp Asp Phe Gln Leu Phe Phe Asn Lys Leu Ile Phe Ile  
180 185 190

Leu His Phe Leu Leu Tyr Ser Lys  
195 200

<210> 7

<211> 14

<212> PRT

<213> Mycoplasma hyopneumoniae

<220>

<221> UNSURE

<222> 3

<223> Incomplete sequence obtained from publication WO 96/28472

<400> 7

Ala Gly Xaa Trp Ala Lys Glu Thr Thr Lys Glu Glu Lys Ser  
1 5 10

<210> 8

<211> 10

<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
Oligonucleotide

<400> 8  
Ala Trp Val Thr Ala Asp Gly Thr Val Asn  
1 5 10

<210> 9  
<211> 21  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
Oligonucleotide

<400> 9  
Ala Ile Val Thr Ala Asp Gly Thr Val Asn Asp Asn Lys Pro Asn Gln  
1 5 10 15  
Trp Val Arg Lys Tyr  
20

<210> 10  
<211> 30  
<212> DNA  
<213> Artificial Sequence

<220>  
<221>  
<222>  
<223> Description of Artificial Sequence:  
Oligonucleotide

<400> 10  
tgytgrgcna argaracnac naargargar 30

<210> 11  
<211> 30  
<212> DNA  
<213> Artificial Sequence

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Oligonucleotide

<400> 11  
tgtttagcwa aagaaacwac waaagaagaa 30

<210> 12  
<211> 27  
<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence:  
Oligonucleotide

<400> 12

tgrgtnacng cngayggcac ngttaay

27

<210> 13

<211> 27

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence:  
Oligonucleotide

<400> 13

tgagtwacwg cwgatggwac wgtwaat

27

<210> 14

<211> 26

<212> DNA

<213> Artificial Sequence

<220>

<221>

<222>

<223> Description of Artificial Sequence:  
Oligonucleotide

<400> 14

rttnacngtn ccrtcngcng tnacyc

26

<210> 15

<211> 26

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence:  
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<400> 15

attsacsgts ccatcsgcsg tsactc

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<210> 16

<211> 21

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence:

Oligonucleotide

<400> 16  
tttgagacat cagtgatttg c 21

<210> 17  
<211> 22  
<212> DNA  
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<223> Description of Artificial Sequence:  
Oligonucleotide

<400> 17  
gaacgaaaat ccgaaattat gg 22

<210> 18  
<211> 22  
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<223> Description of Artificial Sequence:  
Oligonucleotide

<400> 18  
ctatctactg aagaatctca cc 22

<210> 19  
<211> 20  
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<223> Description of Artificial Sequence:  
Oligonucleotide

<400> 19  
gtgatgccgt tcacaagatg 20

<210> 20  
<211> 21  
<212> DNA  
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Oligonucleotide

<400> 20  
cactaagaac gctgaaaacg g 21

<210> 21  
<211> 21

<212> DNA  
<213> Artificial Sequence

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<223> Description of Artificial Sequence:  
Oligonucleotide

<400> 21  
gattacaact gtaaaaatcga g 21

<210> 22  
<211> 20  
<212> DNA  
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<223> Description of Artificial Sequence:  
Oligonucleotide

<400> 22  
ggcttcttca gttttatagg 20

<210> 23  
<211> 18  
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<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
Oligonucleotide

<400> 23  
aaactcgc aaactcgc 18

<210> 24  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
Oligonucleotide

<400> 24  
gaaatgcctg ataaacaacc 20

<210> 25  
<211> 22  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
Oligonucleotide

<400> 25

cttcagaaat ggtttcagtt gc

22

<210> 26  
<211> 25  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
Oligonucleotide

<400> 26  
gctagataac cagcgataaaa atcag

25

<210> 27  
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<212> DNA  
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<220>  
<223> Description of Artificial Sequence:  
Oligonucleotide

<400> 27  
tgcataatcc tgatttatac

19

<210> 28  
<211> 22  
<212> DNA  
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<220>  
<223> Description of Artificial Sequence:  
Oligonucleotide

<400> 28  
tgaaagtcat cgtaattaaa ac

22

<210> 29  
<211> 34  
<212> DNA  
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<223> Description of Artificial Sequence:  
Oligonucleotide

<400> 29  
aatcggcata tgtggataa agaaacaact aaag

34

<210> 30  
<211> 34  
<212> DNA  
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<220>  
<223> Description of Artificial Sequence:  
Oligonucleotide

<400> 30  
ggagtaatct agattattaa tatcgtaat taag 34

<210> 31  
<211> 23  
<212> DNA  
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<220>  
<223> Description of Artificial Sequence:  
Oligonucleotide

<400> 31  
gtttttgaat ataatagaaa atg 23

<210> 32  
<211> 28  
<212> DNA  
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<220>  
<223> Description of Artificial Sequence:  
Oligonucleotide

<400> 32  
tttattaaaaa aataattgaa agtcatcg 28

<210> 33  
<211> 28  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
Oligonucleotide

<400> 33  
ctattttgta attggcataaa aaactgcc 28

<210> 34  
<211> 24  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
Oligonucleotide

<400> 34  
gataaaatgg aataaaatttc ttgg 24

<210> 35  
<211> 21  
<212> DNA  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence:  
Oligonucleotide  
  
<400> 35  
caggttggga ggcaattcaa a

21

<210> 36  
<211> 24  
<212> DNA  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence:  
Oligonucleotide  
  
<400> 36  
caaaaatgtt tgggtacttt ctgg

24

<210> 37  
<211> 21  
<212> DNA  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence:  
Oligonucleotide  
  
<400> 37  
cacaagatgg taaaaaatcc c

21

<210> 38  
<211> 22  
<212> DNA  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence:  
Oligonucleotide  
  
<400> 38  
ggaattgact ggactgatac tg

22

<210> 39  
<211> 22  
<212> DNA  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence:  
Oligonucleotide

<400> 39  
gccggatggc ttgcaggata tg

22

<210> 40  
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<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
Oligonucleotide

<400> 40  
taaagcttgg aatctaaaaa attc

24

<210> 41  
<211> 457  
<212> PRT  
<213> Mycoplasma hyorhinis

<400> 41  
Met Asn Phe Lys Lys Ser Leu Leu Phe Leu Thr Gly Thr Ile Ser Thr  
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Val Ala Ser Val Ala Thr Phe Val Ser Cys Gly Glu Thr Asp Lys Glu  
20 25 30

Gly Lys Ile Ile Arg Ile Phe Asp Asn Ser Phe Val Lys Asp Arg Gln  
35 40 45

Ala Glu Ile Glu Lys Ala Lys Asn Phe Asp Phe Asn Thr Val Leu Leu  
50 55 60

Thr Ala Gly Gly Thr Val Gln Asp Lys Ser Phe Asn Gln Ser Ile Trp  
65 70 75 80

Glu Ala Val Leu Glu His Tyr Asp Gln Ile Glu Lys Thr Thr Asn Leu  
85 90 95

Asp Arg Val Ser Gln Glu Thr Asn Asn Gln Ser Glu Leu Ile Gly Lys  
100 105 110

Tyr Lys Asn Phe Leu Asn Gly Asn Lys Asn Val Trp Ile Leu Thr Gly  
115 120 125

Phe Gln Gln Gly Gln Glu Phe Pro Lys Phe Leu Lys Gln Thr Asp Ser  
130 135 140

Asn Gly Lys Lys Tyr Ser Asp Leu Leu Ala Glu Lys Lys Val Ile Ile  
145 150 155 160

Val Ala Val Asp Trp Asp Leu Ser Lys Glu Asp Lys Asp Leu Ile Lys  
165 170 175

Ala Gly His Phe Ile Ser Leu Leu Tyr Lys Thr Glu Glu Ala Gly Phe  
180 185 190

Ile Ala Gly Tyr Ala Ser Ser Lys Phe Leu Ala Tyr Lys Phe Pro Asn  
195 200 205

Asp Glu Ala Lys Arg Thr Ile Ala Pro Phe Gly Gly Gly His Gly Ala  
210 215 220

Gly Val Thr Asp Phe Ile Ala Gly Phe Leu Ala Gly Ile Ala Lys Tyr  
225 230 235 240

Asn Asn Asp Asn Pro Thr Ala Lys Val Thr Ile Ser Asp Asn Asn Ile  
245 250 255

Asn Ile Asp Thr Gly Phe Ile Ser Asn Asp Lys Thr Ala Thr Phe Ile  
260 265 270

Asn Gly Ile Val Asn Lys Ser Ser Leu Val Leu Pro Val Ala Gly Ser  
275 280 285

Leu Thr Ser Ser Val Val Asp Ala Ile Lys Lys Ser Asn Lys Asp Thr  
290 295 300

Lys Tyr Leu Ile Gly Val Asp Thr Asp Gln Ser Lys Ile Phe Ser Pro  
305 310 315 320

Ala Thr Val Phe Phe Thr Ser Ile Glu Lys His Leu Gly Arg Thr Ile  
325 330 335

Tyr Gln Val Leu Thr Asp Ile Trp Leu Lys Lys Glu Asp Ser Lys Phe  
340 345 350

Leu Gly Ser Phe Arg Ser Phe Lys Leu Thr Asn Pro Ala Asn Ala Thr  
355 360 365

Val Tyr Lys Gly Ile Ser Asp Asp Phe Val Gly Val Ser Asn Ser Thr  
370 375 380

Val Ala Asp Ala Asp Lys Val Lys Ala Gln Glu Phe Leu Asn Glu Ala  
385 390 395 400

Thr Ala Asp Phe Lys Lys Gln Ile Gln Ala Asn Pro Thr Asn Tyr Lys  
405 410 415

Ser Val Leu Gly Ile Pro Thr Met Leu Ile Asn Asp Asn Asp Ala Lys  
420 425 430

Asp Asn Glu Lys Ala Ser Leu Phe His Phe Asp Asn Trp Gln Thr Tyr  
435 440 445

Trp Ala Phe His Ser Arg Phe Ile Asn  
450 455